to-voxel mapping between the initial planning scan and the treatment scan. Therefore, deformation maps can be applied to propagate contours from planning CT to daily images, but also to compute dose distribution from the deformed images for dose accumulation purpose.
In this presentation, we will describe the general framework of deformable image registration, and will cover the main class-solutions for registration-based recontouring according to the tumor location and the available imaging modality, i.e. kV- or MV/CB-CT. Typical adaptive workflows based on deformable registration will be presented, as well as their advantages and potential limitations. Last, we will emphasize the essential role of the operator for accuracy and consistency check of the deformed contours, any inaccuracy in this step necessarily introducing systematic errors in the planning process.

SP-0117
Clinical appplication of atlas-based autosegmentation for contouring of multiple treatment sites
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In the Erasmus MC radiotherapy department, atlas-based auto-segmentation of both clinical target volumes and organs at risk (OARs) is an important time-saving tool in daily clinical routine to assist both physicians and technicians. The accuracy of delineations has become increasingly important due to enhanced conformality of dose distributions as realized by IMRT and VMAT, and the use of reduced PTV margins in combination with image guidance. Clinical validation of atlas-based auto-segmentation for head-and-neck patients showed a reduction of hands-on time for delineation from 180 to 66 minutes, where structures were evaluated as 'minor-deviations, editable' or better (D. Teguh ; Int. J. Radiation Oncology Biol. Phys., Vol. 81, No. 4, pp. 950–957, 2011). The influence of geometric differences between autocontours and manual delineations by different observers on the dosimetric impact can differ for CTV and for OAR (Voet PW, Radiother. Oncol. 2011 Mar;98(3):373-7). We clinically implemented Admire (Elekta AB, Sweden) as part of our workflow in 2010. In this workflow, critical review and editing of the autocontours is still relevant.
For several target sites, a database was created containing fully contoured reference CT data sets (atlases). Depending on the tumor site, one or more atlases are used as an input for the generation of the patient-specific delineation (using the staple algorithm). The strategy of a single atlas can particularly be useful in case of adaptive treatments, resulting in a quick and more accurate autocontouring using the original delineated patient CT as the only atlas. An overview of the clinical implementation of Admire with regard to several tumor sites and the relation to treatment techniques such as breath-hold will be presented.

Poster Viewing: 3: Clinical: Gastrointenstinal and gynaecology

PV-0118
Prognostic impact of presurgical Ca 19-9 level in pancreatic adenocarcinoma: a pooled analysis.
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Purpose or Objective: Preoperative level of CA 19-9 (prCA19.9) predicts survival of patients (pts) undergoing surgery for pancreatic adenocarcinoma (PAC). Actually, there is no evidence of using prCA19.9 as a marker customizing and modulating effectiveness of adjuvant treatment or predicting pattern of failure. Therefore, the purpose of this pooled analysis was to determine whether prCA19.9 could predict overall survival (OS), local control (LC), disease metastasis free survival (DMFS) and evaluate effectiveness of adjuvant therapies in a broad population.

Material and Methods: We performed a multicenter retrospective analysis of 1122 patients (pts) who underwent surgical resection +/- adjuvant treatment [chemotherapy (aCT), radiotherapy +/- concomitant CT (RCT)] for PAC between 2000 and 2014 from 8 different institutions. Among 700 pts with prCA19.9 value we applied the Kaplan-Meier method and the log-rank test to investigate differences in OS, LC, DMFS between defined groups based on: clinical and pathological factors, 4 prCA19.9 cutoff (5, 37, 100, 353) and 5 relative prCa19.9 classes (0.0-5.0, 5.1-37.0, 37.1-100, 100.1-353.0, >353.1). We fitted Weibull regression model with shared frailty on institution to identify independent predictors of OS using data from 404 pts with complete information. We applied a backward stepwise strategy to select the covariates, forcing CRT and RT in the final model.

Results: Median follow-up (FU) was 27 months (2-225). At univariate analysis there was a strong impact of prCA19.9 classes (0.0-5.0, 5.1-37.0, 37.1-100, 100.1-353.0, >353.1) on 5-years OS (5.7% vs 37.9 vs 27.1 vs 17.4 vs 10.9, p< 0.001, Figure 1), 5-years LC (47.2% vs 63.3% vs 59.4% vs 43.4% vs 50.2%, p= 0.008), 5-years DMFS (17.0% vs 46.0% vs 39.0% vs 26.7 vs 23.4, p<0.001), respectively. Only in pts with prCA 19.9 > 353.1 U/ml aCT had positive impact on 5-year OS (47.4% in pts treated with aCT vs 30.2% in pts not treated with aCT, p= 0.006). At multivariable model, sub-analysis of 404 pts showed (Table 1): worse OS for grading 3 tumor (HR: 1.85 95%CI 1.26-2.70, p= 0.002) tumor diameter > 30 mm (HR: 1.85, 95%CI: 1.35-2.53, p< 0.001), and better OS for pts treated with RCT doses > 50 Gy (HR: 0.38, 95%CI: 0.23-0.63, p< 0.001). Median OS worsened in pts with prCA19.9 >100 and <353 (HR: 1.77, 95%CI: 1.23-2.56, p= 0.002) and in pts with prCA19.9 ≥353.1 (HR: 1.92, 95%CI: 1.34-2.76, p<0.001).

Figure 1: Impact of prCA19.9 on OS